

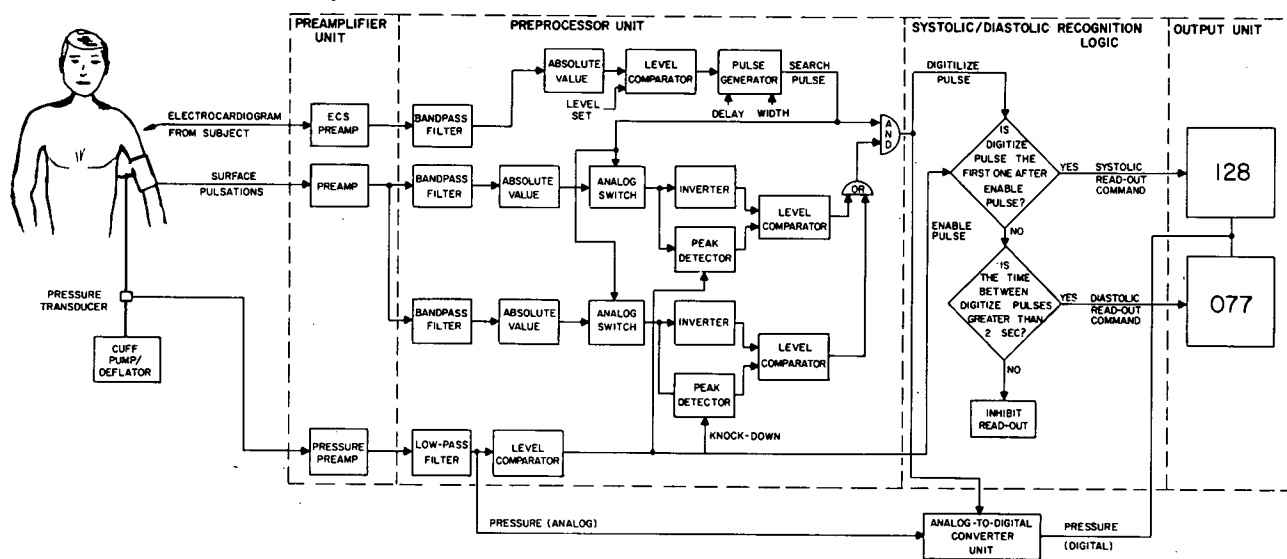
NASA TECH BRIEF

Manned Spacecraft Center



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A System for the Automatic Measurement and Digital Display of Systolic and Diastolic Blood Pressures



Block Diagram of System for Automatic Measurement and Digital Display of Systolic and Diastolic Blood Pressures

A highly accurate, automatic system for the measurement and digital display of systolic and diastolic blood pressure has been developed and successfully tested.

The basic components of the system are: (1) a occluding cuff with a mounted cuff microphone; (2) a cuff pump/deflator; (3) a pressure transducer; (4) a preamplifier unit; (5) an electrocardiograph machine, and (6) an analogue-to-digital convertor unit, and a digital display unit. The system utilizes the indirect auscultatory method, based on Korotkoff sounds, for the measurement of systolic and diastolic blood pressures.

The evaluation of recorded wave forms of Korotkoff sounds have established that the appearance and

disappearance of high frequency notches are highly correlative to clinically determined systolic and diastolic blood pressure values. The automatic system described detects and processes the Korotkoff sounds and then digitally displays the corresponding systolic and diastolic blood pressures, based on the appearance and disappearance of high frequency notches and corresponding cuff pressures.

This automatic system possesses many advantages. It can be used not only to measure blood pressure, but also to monitor blood pressure continually, without the fatigue and inter-observer variations associated with manual methods. Thus this innovation has obvious applications with surgical and intensive care units. Moreover

(continued overleaf)

the system can be integrated into other measuring systems or devices, such as pneumotachometers. Pressure measurement variations associated with instrument differences, such as cuff width, cuff length, and stethoscope response characteristics, are eliminated. Observer associated variations, such as reaction time, mental concentration, rate of inflation, rate of deflation, stethoscope placement, etc. are also eliminated. The data collected is, therefore, applicable to standardization and has a higher degree of reproducibility.

Due to refinements in filtering, logic capabilities and the pressure read-out, the system is accurate to within ± 2 mmHg. Medical research institutions, hospitals, clinics, and multi-phase medical screening clinics should be interested in this system.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
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Houston, Texas 77058
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Patent status:

No patent action is contemplated by NASA.

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